

CITY OF DURHAM

TRAFFIC CALMING GUIDELINES

Outlines the general evaluation and decision-making procedure for the City of Durham Department of Transportation to determine priorities among city-maintained streets for traffic calming.



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INTRODUCTION

The City of Durham's traffic calming program is intended to create safe and attractive streets, increase safety, enhance the street environment, increase access for all modes of transportation, and reduce the need for police enforcement.

This program is most appropriate when vehicles are traveling from one thoroughfare to another by way of a more convenient neighborhood route. It may not be warranted by local neighborhood traffic. It is not intended for use outside of residential areas nor will it completely eliminate random speeding events.

EVALUATION PROCEDURE

When traffic calming is requested, the Transportation Department will make site visits to the street to observe existing conditions:

- Housing density
- Development activity
- On-street parking
- Pedestrian and bicycle activity
- Geometric features of the road (width, sight distance, existence of sidewalk, street lighting, etc.)
- Transit

The department will also conduct a crash analysis. If it is determined that speeding or crashes are a potential problem based on this initial investigation, the city will conduct a speed study. (Note: A street is eligible for only one speed study every 5 years, in the absence of any development that would change traffic conditions.) Each street studied will be given an overall point score, based on the existing geometric conditions, history of crashes, speed and volume study results, and other features. Streets will be ranked on a priority list based on this point system, and traffic calming projects will be funded in order of priority.

Traffic calming is intended only for city-maintained streets. State-maintained streets may be studied, but any changes must be approved by the North Carolina Department of Transportation. State-maintained streets will be considered on a case-by-case basis. City-maintained streets may be altered with traffic calming devices, depending on their character, function and volumes of traffic. Among city-maintained streets, there are three types:

- **ARTERIAL STREET** A principal traffic artery, carrying higher volumes of traffic (usually above 8,000 vehicles per day), more or less continuously. This type of road is intended to act as a principal connecting street with higher-volume arterial streets. It will have a speed limit of 35 mph or higher. (Examples: Guess Road, Martin Luther King Jr. Parkway, Broad Street)

- **COLLECTOR STREET** A street or road providing for travel between local streets and the arterial street network, or serving multifamily development or neighborhood centers or services such as schools, parks, or fire stations. It carries high volumes of traffic (usually between 2,500 and 8,000 vehicles per day) and will have a speed limit of 30 mph or higher. (Examples: Angier Avenue, LaSalle Street)

COLLECTOR STREET – RESIDENTIAL A subtype of collector streets, this is a street or road that is residential in nature and carries volumes usually between 2,500 and 5,000 vehicles per day, although these volumes can be higher. It connects local neighborhood streets to higher order roads. The speed limit will be 30-35 mph. (Example: Markham Avenue, Liberty Street)

- **LOCAL STREET** A street or road that carries lower volumes of traffic (usually less than 2,500 vehicles per day) and acts as a starting road for residential traffic. The speed limit will be 35 mph or under (or the speed limit may not be posted, which denotes a 35 mph speed limit, per city ordinance).

Most traffic calming devices are intended for only local and residential collector streets, because they are residential in nature and carry low volumes of traffic. Collector and arterial streets are intended to act as through routes for vehicles to reach higher order streets, and this function (and the street's capacity) must be maintained with any type of traffic calming program. Any traffic calming recommendations by the City's Department of Transportation must be reviewed by any affected city departments, including, but not limited to, the Public Works Department, the Police Department and the Fire Department. Following are descriptions of the types of traffic calming measures that may be used in the city of Durham. Other measures can be considered depending on the type of street and nature of the speeding problem.

NOTE: Traffic signals and multi-way stop control are not intended for use as traffic calming measures and will not be considered under this program. Studies to determine if a traffic signal or multi-way stop is appropriate for an intersection will be conducted based on criteria in the Manual of Uniform Traffic Control Devices (MUTCD), approved by the U.S. Department of Transportation and accessed at http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm. Warrants for traffic signals are established in Part 4 of the MUTCD, and warrants for multi-way stop control are established in Part 2b.

TRAFFIC CALMING MEASURES: **Non-Physical**

These measures are non-physical and will be considered for a street before any physical measures or devices are installed.

► **Speed Enforcement**

Temporary targeted speed enforcement by the police department.

TYPE OF ROADS – All

Advantages

- May be implemented immediately, with little planning and funding
- No impact to emergency response times
- Effective for reducing speeds during the period of enforcement
- Creates a higher sense of security

Disadvantages

- Increases maintenance costs
- Not highly effective – most drivers travel at the speed they feel most comfortable and safe

► **Radar Trailers**

Placed adjacent to a roadway, it will display a passing vehicle's speed and remind drivers of the posted speed.

TYPE OF ROADS – All

Advantages

- May be implemented immediately, with little planning and funding
- No impact to emergency response times
- Creates a higher sense of security

Disadvantages

- May only be effective for short periods of time (while trailer is on the site)
- Effective for only one direction of travel at a time
- May only be effective for short distances
maintained street must be approved by NCDOT

TRAFFIC CALMING MEASURES: **Low-cost : Physical**

These measures are low-cost and will be considered before any devices are installed.

► **Lowering of Speed Limit**

Replacing any speed limit signs installed on the street with new ones designating a lower speed limit (see city's speed limit policy). This will be considered only after a speed study shows that a lower speed limit is appropriate and would be effective. Studies have shown that artificially lowering a speed limit will not result in lower speeds.

TYPE OF ROADS – Local (will not be lowered below 25 mph), residential collector (will not be lowered below 30 mph)
(Note: Lower speed limits can be approved by Department of Transportation staff based on engineering judgment.)

Advantages

- Inexpensive
- No impact to emergency response times

Disadvantages

- Increases maintenance costs
- Not highly effective – most drivers travel at the speed they feel most comfortable and safe

► **Lane Striping**

Visually narrowing the travel lanes using painted lines to delineate shoulders or bike lanes

TYPE OF ROADS – All

Advantages

- Inexpensive
- Can be installed in minimal time
- No impact to emergency response times

Disadvantages

- Only roads with certain geometric features can be considered for this treatment (adequate roadway width and sight distance)
- May impact on-street parking
- Increases maintenance costs
- Any changes to pavement markings on a state-maintained street must be approved by NCDOT



TRAFFIC CALMING MEASURES: **Low-cost : Physical**

► **Neighborhood Greenway/Bike Boulevard**

A type of bikeway composed of a low-speed street which has been “optimized” for bicycle traffic. These are best utilized on low-speed and low-volume streets, and treatment options can range from pavement markings and signage to more expensive and permanent traffic calming and/or intersection treatments. Implementation options may include one or more traffic calming measures indicated elsewhere in these guidelines.

TYPE OF ROADS – Local

Advantages

- Encourages bicycling and pedestrian activity
- Discourages cut-through traffic

Disadvantages

- May be ineffective if not utilized



► **On-Street Parking**

Create parking spaces along the street to narrow the travel lanes and provide friction for cars in the travel lanes

TYPE OF ROADS – All

Advantages

- Provides more parking
- Shortens pedestrian crossing distance
- Encourages pedestrian activity (provides a buffer between the sidewalk and the street)

Disadvantages

- May be ineffective if not utilized
- May reduce sight distance for drivers and pedestrians
- May increase side-swipe type crashes
- May restrict bicycle use of the road
- May impede effective solid waste collection
- Encourages mid-block pedestrian crossings

TRAFFIC CALMING MEASURES: **Low-cost : Physical**

► **Speed Limit Bollards**

Speed limit signs are installed on bollards located on the centerline within the street to serve as a more visible reminder to drivers

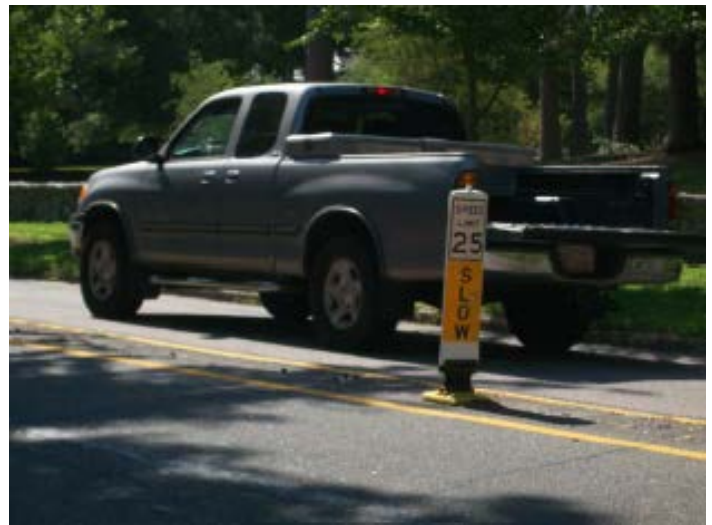
TYPE OF ROADS – Collector and Residential Collector

Advantages

- Gives a visible reminder to drivers of the speed limit
- Easy to install

Disadvantages

- May be ineffective over time (as drivers get used to them)
- Increases maintenance costs
- Only roads with certain geometric features can be considered for this treatment (adequate roadway width and sight distance)



TRAFFIC CALMING MEASURES: **Low-cost : Physical**

► **Rumble Strips**

A series of raised strips across a road or along its edge, changing the noise a vehicle's tires make on the surface and so warning drivers of speed restrictions or of the edge of the road

TYPE OF ROADS – Arterials, Collectors (with no houses or businesses nearby)

Advantages

- Gives a visible and aural reminder to drivers
- Easy to install

Disadvantages

- Noise – up to 80 dB at a distance of 50 feet (equivalent to the sound of heavy truck traffic)



► **Neighborhood Gateways**

Converting the entrance of a residential area into a neighborhood gateway by means of an entry structure or signing in conjunction with other aesthetic features to emphasize the residential neighborhood.

TYPE OF ROADS – All

Advantages

- Discourages cut-through traffic
- Improves neighborhood identity

Disadvantages

- Potential for vandalism
- Neighborhood must agree to maintain
- Entry structures usually installed on private property

TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

These measures are more expensive and can be installed on a permanent basis. Streets that meet the criteria for these types of traffic calming measures will be placed on a priority list. The installations will occur only when funds become available. Some of these measures require time for planning, design and construction, so the timelines will be longer for installation.

► **Neighborhood Traffic Circles**

A circular island in the middle of an intersection, the traffic circle provides counter-clockwise traffic movement. Incoming traffic must yield to the vehicles already navigating the circle. These are often installed to address a history of yielding crashes at a multi-way stop.

TYPE OF ROADS – Local

Advantages

- May decrease speeds of through vehicles, since they have to slow down to enter the circle
- Reduces collisions and severity of collisions
- May decrease volume while maintaining access to neighborhood vehicles

Disadvantages

- May require the removal of nearby street parking
- Increases maintenance costs
- May cause sight distance problems
- Has an impact on emergency response times
- May impede larger vehicles
- Need adequate right-of-way for installation

Installation cost: \$5,000-\$15,000



TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► **Speed Humps or Speed Tables**

Raised sections of driving surface installed across the width of the street with a flat section in the middle, speed humps (also called speed tables) will be installed only on city-maintained streets that meet certain criteria (a petition signed by a certain percentage of residents is also required). The city Department of Transportation's speed hump policy can be found here: <http://durhamnc.gov/ich/op/dot/Documents/Speed%20Hump.pdf>.

TYPE OF ROADS – Classified as local residential street, average daily volumes between 250 and 2,000 vehicles per day

Advantages

- Decreases average speeds on a street and may reduce volumes

Disadvantages

- May increase speeds in between speed humps
- Increased noise
- Additional signage will have a visual impact
- Causes driver discomfort
- Impacts emergency response times (fire department must approve any installation)

Installation cost: \$2,500-\$3,000 per speed hump



TRAFFIC CALMING MEASURES: **Speed Hump Policy**

Speed humps may be approved for installation on City maintained streets where conditions meet the following criteria:

1. A petition bearing the signatures of at least 75% of the property owners within the affected block (i.e., property owners with lots abutting the petitioned street blocks) is required. The petition form supplied by the Department of Transportation must be used in obtaining signatures.
2. The street must be functionally classified as a local street. Speed humps are not permitted on transit routes or thoroughfares as identified by the Durham-Chapel Hill-Carrboro Urban Area Thoroughfare Plan or by the Comprehensive Transportation Plan when its adoption supersedes the Thoroughfare Plan. The street must be residential in nature with: a posted speed limit of 25 mph or less, a minimum average daily traffic (ADT) volume of 250 vehicles per day, and a maximum ADT of 2000 vehicles per day (unless a component of a comprehensive local traffic management plan). The street must be paved and provide adequate drainage.

Speed humps may be placed a maximum of 750 feet apart (275 foot intervals is ideal) and a minimum of 200 feet from intersections where approaches of the street in question are controlled by traffic signals or stop signs. On streets where the intersection approaches are uncontrolled, humps may be placed a minimum of 100 feet from the intersection. Speed humps should be installed so as to avoid several street features. These include drainage features, utilities, driveways, severe horizontal or vertical curves and traffic control devices. All humps will be placed in close proximity to property lines whenever possible. Humps shall not be placed on streets less than 750 feet in length.

3. The Department of Transportation will review the traffic on the street when a request is made. Components of this review may include traffic counts, speed studies, and accident analyses. The 85th percentile speed on the street must exceed the posted speed limit by more than 10 miles per hour to warrant the installation of speed humps. If not already in place, the Department of Transportation will study and determine whether the speed limit should be reduced to 25 miles per hour. A follow up speed study will occur three months after this speed limit reduction. Alternative traffic control options will be evaluated as part of the review.
4. The Department of Transportation, in analyzing the request for speed humps, shall be responsible for soliciting input from emergency services, utilities (private and public) and other key agencies (including school transportation and refuse removal services). If the necessary criteria under this Policy are met to justify the installation of speed humps, but one or more of these agencies objects, a final determination will be made by the City Manager.
5. Notwithstanding criteria number 1 (a petition bearing the signatures of 75% of the property owners within the affected block for which speed humps are requested), the City Council may approve the installation of speed humps on City maintained public streets when so doing is determined to be in the interest of public safety. Such approval may occur

TRAFFIC CALMING MEASURES: **Speed Hump Policy**

after City Council has ordered a study pursuant to a request for speed humps, held a public hearing at which the findings and recommendations of the study have been presented and determined that speed humps are the most effective remedy to the public safety concern. The study conducted pursuant to this section shall consider the impact of speed humps on the delivery of emergency services and shall also consider other alternatives to address the concerns of public safety. Property owners within the block(s) for which speed humps are considered for installation in accordance with this section of the Speed Hump Policy shall be contacted and afforded an opportunity to comment on the proposed installation of speed humps and the findings of the study. Council shall consider the findings and recommendations of the study and comments received at the public hearing in making a determination on the installation of speed humps.

6. Notwithstanding the minimum volume criteria set forth in criteria 2 above, speed humps may be installed in the following unique circumstances:
 - a. On streets within 1000 feet of a school or park with the speed criteria in 3 above; pending receipt of a valid petition in accordance with criteria 1 above.
 - b. On streets where the Durham Police Department recommends speed hump installation as part of a comprehensive crime reduction program.
7. The installation of speed humps is subject to the availability of funding. Those streets not meeting these criteria will be considered for alternative measures where appropriate.
8. Following an adequate review and analysis period, speed humps may be removed if a petition with signatures from a majority (more than 50%) of the affected property owners is obtained, or where traffic circulation and safety concerns justify their removal as determined by the City Manager. Speed humps installed pursuant to Section 5 of this policy shall be removed only upon order of City Council.

Note: Approved by Durham City Council June 1, 2015

TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► **Raised Crosswalks**

A higher section of pavement with a marked crosswalk with ramps for vehicles leading and following the crosswalk, which is on the flat section. Typically located at a midblock crossing and is the width of a crosswalk, usually 10 to 15 feet.

TYPE OF ROADS – Local

Advantages

- Slows average speeds in an area with a marked crosswalk
- Increases pedestrian visibility

Disadvantages

- May increase speeds after the crosswalk
- Inappropriate for crossings on curves or steep roadway grades
- Impacts emergency response times (fire department must approve any installation)

Installation cost: Can range from \$2,000 to \$20,000, depending on drainage conditions and material used



TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► **Raised Intersections**

Flat raised areas covering entire intersections, with ramps on all approaches and often with brick or other textured materials on the flat section and ramps.

TYPE OF ROADS – Local

Advantages

- Causes reduction in through movement speeds at intersection
- No effect on access
- Improves intersection safety for pedestrians

Disadvantages

- Does not cause a significant reduction in midblock speeds
- Increased noise
- Causes driver discomfort
- Impacts emergency response times (fire department must approve any installation)



Installation cost: Can range from \$2,000 to \$25,000, depending on drainage conditions and material used.

TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► Neckdowns

Curb extensions that shorten crossing distances for pedestrians and narrow the travel lane. They can be separated from the curb with curb and gutter or attached to the curb.

TYPE OF ROADS – Collector

Advantages

- Increased pedestrian safety

Disadvantages

- Requires bicyclists to merge with traffic
- Has an impact on emergency response times
- Loss of some on-street parking
- May not be effective at lowering speeds

Installation cost: \$10,000-\$25,000 per curb extension, depending on the type used

Longer timeline before installation because of design requirements; drainage design considerations may prohibit installation at some locations



A neckdown extending the curb and sidewalk



A neckdown allowing drainage between the new structure and the existing curb

TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► Chicanes

A series of narrowings or curb extensions that alternate from one side of the street to the other forming S-shaped curves

TYPE OF ROADS – Local

Advantages

- Decreases pedestrian crossing distance
- Reduces speeds

Disadvantages

- Limits bicyclists' use of road
- Has an impact on emergency response times
- Loss of on-street parking
- Potential drainage problems

**Installation cost: \$5,000-\$15,000 per set,
depending on design elements**

**Longer timeline before installation because
of design requirements; drainage design
considerations may prohibit installation at
some locations**



TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► **Medians**

Islands that replace the centerline and narrow the travel lanes

TYPE OF ROADS – All

Advantages

- Create a pedestrian refuge
- May reduce speeds and volumes
- Creates a positive aesthetic effect
- Prevents passing

Disadvantages

- Loss of on-street parking
- May impact emergency response times
- Limits access depending on length

**Installation cost: Depends on length –
\$20,000 and up**

**Longer timeline before installation because
of design requirements**



TRAFFIC CALMING MEASURES: **Higher-cost : Physical**

► **Diagonal Diverters (Partial Street Closures)**

Barriers placed diagonally across an intersection, blocking through movement. These types of street closures are most appropriate for neighborhood areas with grid network streets where cut-through traffic is a significant problem.

TYPE OF ROADS – All

Advantages

- Maintains full pedestrian and bicycle access
- Reduces the volume of vehicles

Disadvantages

- Reduces access options for local residents and emergency services
- Reconstruction of corner curbs may be necessary
- Drainage may be impacted
- Requires approval of the entire neighborhood

Installation cost: \$10,000 to \$20,000, depending on the design elements

Longer timeline before installation because of design requirements

